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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: CHRISTOPHER L. MCCRANK	Group Art Unit: 2637
Serial No.: 09/361,893	Examiner: EDITH M. CHANG
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	Atty. Dkt.: 2069.005900/TT2866
For: METHOD AND APPARATUS FOR FREQUENCY HOPPING IN A SPREAD SPECTRUM DIGITAL CORDLESS TELEPHONE SYSTEM	CUSTOMER NO.: 23720

APPEAL BRIEF

CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8	
DATE OF DEPOSIT:	May 23, 2005
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MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

On March 18, 2005, Appellant filed a Notice of Appeal in response to a Final Office Action dated November 18, 2004, issued in connection with the above-identified application. In support of the appeal, Appellant hereby submits this Appeal Brief to the Board of Patent Appeals and Interferences.

Since the Notice of Appeal for the present invention was received and stamped by the USPTO Mailroom on March 23, 2005, the two-month date for filing this Appeal Brief is May 23, 2005. Since this Appeal Brief is being filed on May 23, 2005, this paper is believed to be timely filed.

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If an extension of time is required to enable this paper to be timely filed and there is no separate Petition for Extension of Time filed herewith, this paper is to be construed as also constituting a Petition for Extension of Time Under 37 CFR § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

The Commissioner is authorized to deduct the fee for filing this Appeal Brief ($500.00) from Legerity, Inc. Deposit Account No. 50-1591/TT2866. No other fee is believed to be due in connection with the filing of this document. However, should any fee under 37 C.F.R. §§ 1.16 to 1.21 be deemed necessary for any reason relating to this document, the Commissioner is hereby authorized to deduct said fee from **Legerity, Inc. Deposit Account No. 50-1591/TT2866.** [1]

I. REAL PARTY IN INTEREST

The present application is owned by Legerity, Inc.

II. RELATED APPEALS AND INTERFERENCES

Appellant is not aware of any related appeals and/or interferences that might affect the outcome of this proceeding.

III. STATUS OF CLAIMS

Claims 1-20 remain pending in this application.

22

[1] In the event the monies in that account are insufficient, the Director is authorized to withdraw funds from Williams, Morgan & Amerson, P.C. Deposit Account No. 50-0786/2000.082700.

The Examiner rejected claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable by U.S. Patent No. 5,966,665 (***Taki***) in view of U.S. Patent No. 4,654,859 (***Kung***). The Examiner also rejected claim 20 under 35 U.S.C. § 103(a) as being unpatentable by U.S. Patent No. 5,966,665 (***Taki***) in view of U.S. Patent No. 4,654,859 (***Kung***) as applied to claim 1, and further in view of U.S. Patent No. 5,590,410 (***Deutsch.***).

The claims currently under consideration, *i.e.*, claims 1-20, are listed in the Claims Appendix.

IV. STATUS OF AMENDMENTS

After the Final Rejection, no claim amendments have been made.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Embodiments of the present invention provide for communications transmission between a first and second communication units. Embodiments of the present invention call for the communication units to communicate using a first frequency during a first time frame and selecting an initial frequency using a voltage controlled oscillator. A second frequency may be selected by multiplying the initial frequency by a frequency multiplier during a second time frame. The first and second communication units may then communicate over a second frequency over a second time frame.

Referring to Figure 1, a simplified block diagram of a communications system 100 is shown in accordance with the present invention. The communications system 100 includes a base unit 110 and a remote unit 120. The base and remote units 110, 120 each include an

antenna 125 for communication therebetween over a radio frequency (RF) link 130. In the illustrated embodiment, the communications system 100 is embodied as a digital cordless telephone system employing a frequency-hopped, spread spectrum (FHSS) communications protocol over the RF link 130. The RF link 130 includes a pair of frequencies, one of which is used by the base unit 110 to transmit communication signals to the remote unit 120, and the other frequency being used by the remote unit 120 to transmit signals to the base unit 110. Each frequency pair used to establish communication between the base and remote units 110, 120 constitutes a radio channel. *See* Specification, pg. 6, line 18 – pg. 7, line 4.

In accordance with one embodiment, the base unit 110 is coupled to a public switched telephone network (PSTN) 140 to provide telephonic services from the PSTN 140 to the remote unit 120. In the illustrated embodiment, the remote unit 120 takes the form of a cordless handset, and includes the conventional components (*i.e.,* microphone, speaker, dial keypad, battery, *etc.*) (not shown) that are inherent to the operation of cordless phones. These components are well known to those of ordinary skill in the art, and are not discussed herein to avoid unnecessarily obscuring the present invention. *See* Specification, pg. 7, lines 6-12.

Turning now to Figure 2, a detailed block diagram illustrating a radio transceiver unit 200 of the base unit 110 and remote unit 120, for establishing the radio communication link 130 therebetween, is shown. The transceiver unit 200 includes a transmitter 205 for transmitting communication signals from either the base or remote unit 110, 120 to a corresponding "communicating" unit (which could be either the remote or base unit 120, 110, respectively). The transceiver unit 200 further includes a receiver 210 for receiving communication signals through the RF link 130 via the antenna 125. In accordance with one

embodiment, the base unit 110 and the remote unit 120 transmit and receive in the 902-928 MHz ISM band in accordance with current Federal Communications Commission (FCC) regulations. *See* Specification, pg. 7, lines 14 – 23.

When communication signals are received by the transceiver unit 200 at the antenna 125, a transmit/receive (TX/RX) switch 215 couples the antenna 125 to the receiver 210 for processing the incoming communication signals over the RF link 130. Conversely, when communication signals are transmitted by the transceiver unit 200, the TX/RX switch 215 couples the transmitter 205 to the antenna 125, thereby transmitting communication signals via the RF link 130 to the opposite communicating unit. *See* Specification, pg. 8, lines 1 – 6.

A controller 220 controls the transmitter and receiver 205, 210 and the TX/RX switch 215 to enable communication between the base and remote units 110, 120. In the illustrated embodiment, the controller 220 is a PhoX controller manufactured by AMD, Inc. of Sunnyvale, California. It will be appreciated, however, that other types of controllers capable of Time-Division-Duplexed (TDD) communication could be used in lieu thereof without departing from the spirit and scope of the present invention. *See* Specification, pg. 8, lines 8-13.

The controller 220 at the base unit 110 serves as a timing master for the communications system 100, and will select and originate the pseudorandom frequency hopping sequence. The technique for implementing this pseudorandomly-ordered frequency hopping sequence is well known to those of ordinary skill in the art. The controller 220 at the remote unit 120 recognizes, synchronizes to, and tracks the frequency hopping sequence set by

the base unit's controller 220 also in accordance with techniques that are well established in the art. Once the frequency hopping pattern is locked by both the base and remote units 110, 120, their respective controllers 220 manage a bursted data stream that conveys the digitized voice and overhead control data information over the radio link 130. *See* Specification, pg. , lines 15 – 23.

The transmitter 205 includes a transmit frequency synthesizer 225, which generates a carrier frequency that is modulated with a digitized voice signal. A phase-locked loop 226 in the transmit frequency synthesizer 225 receives a reference signal from a reference clock oscillator (not shown), which generates a reference clock signal with a frequency typically at 12.8 MHz. The phase-locked loop 226 divides the reference signal to a particular reference frequency, which is typically on the order of 100 kHz. The reference frequency is used to ensure that the carrier frequency output from the transmit frequency synthesizer 225 is stable. A voltage-controlled oscillator (VCO) 227 generates the carrier frequency upon which the digitized voice signal is modulated. In the illustrated embodiment, the carrier frequency is one-third the frequency of the "over-the-air" communication signals transmitted from the antenna 125 (*i.e.,* the carrier frequency is approximately 300 MHz). Use of a low frequency VCO 227 and tripler combination enables fast lock-up time between frequencies. *See* Specification, pg. 9, lines 1 – 12.

A power divider 228 extracts a portion of the signal energy output from the VCO 227 and feeds the signal via a control loop through a filter 230 back to the phase-locked loop 226. This feedback signal is compared by the phase-locked loop 226 with the reference signal from the reference oscillator (not shown). The phase-locked loop 226 controls the VCO 227 by

outputting a particular voltage to the VCO 227 dependent upon the comparison of the reference and feedback signals. Accordingly, the carrier frequency output by the VCO 227 could be increased or decreased by the phase-locked loop 226 to ensure a stable carrier frequency output. *See* Specification, pg. 9, lines 14 – 21.

A modulator 235 modulates the digitized voice signal with the carrier frequency generated by the VCO 227. A frequency multiplier 240 triples the frequency of the modulated signal from the lower frequency of approximately 300 MHz output from the VCO 227 to a frequency commensurate with the desired over-the-air frequency in the 900 MHz range. A power amplifier 245 amplifies the modulated digital radio signal to a predetermined gain so as to facilitate transmission of the modulated digitized voice signal to the opposite communicating unit via the antenna 125. *See* Specification, pg. 9, lines 23 – 25 through pg. 10, lines 1 – 4.

The receiver 210 receives the transmitted communication signal (from the opposite communicating unit) over the RF link 130 at the antenna 125. When receiving communication, the TX/RX switch 215 couples the antenna 125 to the receiver 210 (as shown by the position of the arrow illustrated in Figure 2). A bandpass filter 250, which is coupled to the TX/RX switch 215, filters out undesired frequencies that fall outside the range of the receive frequency band of the base and remote units 110, 120. Such undesired frequencies could be frequencies in the cellular band, as well as several other different types of radio communication bands. The filtered communication signal is then passed through a low noise amplifier 255, and subsequently through another bandpass filter 260 for additional filtering. A frequency shift keying (FSK) demodulator 265, coupled to the bandpass filter 260,

demodulates the filtered communication signal to recover the transmitted digital voice signal. A receive frequency synthesizer 280 generates a carrier frequency using a phase-locked loop 281, VCO 282, and power divider 283 in the same manner as the transmit frequency synthesizer 225 described previously. As with the transmit frequency synthesizer 225, the receive frequency synthesizer 280 also generates a low frequency signal (*i.e.,* a frequency of approximately 300 MHz). The frequency of the signal output from the receive frequency synthesizer 280 is subsequently tripled by a frequency multiplier 275 to bring the carrier frequency to the desired 900 MHz band. *See* Specification, pg. 10, lines 6 – 24.

A downcoverter 266, within the FSK demodulator 265, couples to the bandpass filter 260 and the frequency multiplier 275. The filtered communication signal output from the bandpass filter 260 is downconverted by mixing the signal with the carrier frequency output from the frequency multiplier 275. The downconverter 266 produces two frequencies, *i.e.,* the sum of the frequencies from the frequency multiplier 275 and the bandpass filter 260 (which is approximately 1.8 GHz), and the difference of the frequencies (which is approximately 10.7 MHz). A narrow band filter 267 removes the summed portion (*i.e.,* 1.8 GHz), leaving the remaining difference frequency of 10.7 MHz (*i.e.,* the intermediate frequency). The signal is subsequently amplified by an amplifier 268, filtered by another filter 269, and then passed through a limiting amplifier 270. Subsequent to passing through the limiting amplifier 270, the signal is phase-shifted by a 90-degree phase shift unit 271, and then downconverted by downconverter 272. A slicing circuit 273 then converts the downconverted analog signal from the downconverter 272 to a digital signal that is fed into the controller 220. *See* Specification, pg. 11, lines 1 – 14.

The controller 220 sends data in a time division duplex (TDD) fashion between the base unit 110 and remote unit 120. Accordingly, data flows from the base unit 110 to the remote unit 120 or from the remote unit 120 to the base unit 110, but not in both directions simultaneously. While the base unit 110 is transmitting to the remote unit 120, the base unit receiver 210 and the remote unit transmitter 205 are idle. Conversely, while the remote unit 120 is transmitting to the base unit 110, the base unit transmitter 205 and the remote unit receiver 210 are idle. In accordance with the present invention, while the base unit 110 is transmitting to the remote unit 120, the base unit receiver 120 and the remote unit transmitter 205 are set to their new frequencies according to the pseudorandom frequency hopping sequence. While the remote unit 120 is transmitting to the base unit 110, the base unit transmitter 205 and the remote unit receiver 210 are set to their new frequencies. *See* Specification, pg. 11, lines 16 – 24.

Turning now to Figure 3, a simplified diagram illustrating the spread spectrum frequency hopping technique in accordance with the present invention is shown. The base unit's transmitter 205 transmits to the remote unit's receiver 210 on a first frequency in a first frame 310. Both the VCO 227 in the base unit's transmitter 205 and the VCO 282 in the remote unit's receiver 210 are tuned to communicate on this same first frequency. While the base unit 110 is transmitting to the remote unit 120 in frame 310, the controller 220 tunes the VCO 282 in the base unit's receiver 210 to receive a second frequency as shown at 315 (which occurs during frame 310). Similarly, the VCO 227 in the remote unit's transmitter 205 is also tuned to the second frequency as the VCO 282 of the base unit's receiver 210. The manner in which the base and remote units 110, 120 synchronize to select the same new

frequencies for communication thereover is well known to those of ordinary skill in the art, and will not be discussed herein to avoid unnecessarily obscuring the present invention. *See* Specification, pg. 12, lines 4 – 15.

At a second frame 320, the remote unit's transmitter 205 transmits signals to the base unit's receiver 210 over the second frequency that was selected during the first frame 310. While the remote unit 120 is transmitting to the base unit 110 in frame 320, the controller 220 tunes the VCO 227 in the base unit's transmitter 205 to receive a third frequency as shown at 325. The remote unit's receiver 210 also tunes the VCO 282 to the same third frequency. During a third frame 330, the base unit 110 transmits to the remote unit 120 over the third frequency. While this occurs, at 335, the VCO 282 of the base unit's receiver 210 and the VCO 227 of the remote unit's transmitter 205 tune to communicate over a fourth frequency, which is used by the remote unit 120 to transmit to the base unit 110 at frame 340. *See* Specification, pg. 12, lines 17 – 25.

As previously mentioned, an effective throughput data rate of 32 kbits/sec is needed for simplex digital voice transmission between the base and remote units 110, 120 in a frequency hopped spread spectrum system to enable adequate voice communication. The "base to remote" and "remote to base" transmissions each account for one-half of the transmitting time. In prior art systems, "dwell" time is used to change to the next frequency in the frequency hopping sequence. In accordance with the present invention, however, the digitized voice data between the base and remote units 110, 120 is sent at only twice the data rate (*i.e.*, a total of 64 kbps). This enables a significant increase in communication quality

over the prior art systems which typically need a 96 kbps data rate to compensate for the transmission time and the dwell time. *See* Specification, pg. 13, lines 1 – 11.

Turning now to Figure 4, a system timing diagram illustrating the timing sequence for the frequency hopping technique of the present invention is shown. During time frame A, the base unit's transmitter 205 is enabled as shown at 410, and is transmitting on a first frequency to the remote unit's receiver 210, which is enabled at 430. At time frame B, the base unit's transmitter 205 and the remote unit's receiver 210 become disabled at 410 and 430, respectively. The base unit's receiver 210 and the remote unit's transmitter 205 become enabled at 415 and 435, respectively, thus permitting the remote unit 120 to transmit to the base unit 110. While the remote unit 120 is transmitting to the base unit 110, the VCO 227 of the base unit's transmitter 205 changes to a second frequency as shown at 405, and the VCO 282 of the remote unit's receiver 210 also simultaneously changes to receive the second frequency at 425. *See* Specification, pg. 13, lines 13 – 23.

At time frame C, the base unit's receiver 210 and the remote unit's transmitter 205 become disabled at 415 and 430, respectively. Meanwhile, the base unit's transmitter 205 and the remote unit's receiver 210 are enabled at 410 and 430, respectively. The base unit 110 transmits to the remote unit 120 using the second frequency (actually, the tripled value of the second frequency) that was set by the VCOs 227 and 282 during time frame B. While the base unit 110 is transmitting to the remote unit 120, the VCO 282 of the base unit's receiver 210 changes to receive a third frequency as shown at 420, and the VCO 227 of the remote unit's transmitter 205 also simultaneously changes to the third frequency at 440. Subsequently, at time frame D, the base unit's transmitter 205 and the remote unit's receiver

210 become disabled again at 410 and 430, respectively. And, the base unit's receiver 210 and the remote unit's transmitter 205 become enabled, thus permitting transmission from the remote unit 120 to the base unit 110 using the third frequency (tripled) that was selected by the VCOs 282 and 227 in time frame C. While the remote unit 120 is transmitting to the base unit 110, the VCO 227 of the base unit's transmitter 205 and the VCO 282 of the remote unit's receiver 210 will again change frequencies. *See* Specification, pg. 14, lines 1 – 15.

Turning now to Figure 5, a process 500 for transmitting communication signals between the base unit 110 and remote unit 120 is shown in accordance with the present invention. The process 500 commences at step 510 where it is determined whether to establish communication between the base unit 110 and the remote unit 120. In one embodiment, determining to commence communication between the base and remote units 110, 120 may be in response to a user actuating a communication request button (not shown) on the remote unit 120 or an incoming call being received by the base unit 110 via the PSTN 140. It will be appreciated, however, that the occurrence of a number of different types of events could cause communication to be established between the base and remote units 110, 120, and, thus, need not be limited by the aforementioned examples. *See* Specification, pg. 14, lines 17 – 24.

If communication between the base and remote units 110, 120 is not desired, the process 500 reverts back to step 510. However, if communication is desired, the process 500 continues to step 520 where the VCO 227 of the base unit's transmitter 205 and the VCO 282 of the remote unit's receiver 210 select a first frequency from the pseudorandomly-ordered frequency hopping pattern generated by the controller 220. At step 530, the base unit's

transmitter 205 and the remote unit's receiver 210 are enabled, and the base unit's receiver 210 and remote unit's transmitter 205 are disabled by each respective unit's controller 220. The base unit 110 subsequently transmits communication signals to the remote unit 120 during a first time frame, at step 540, using the first frequency (tripled) selected in step 520. The VCO 282 of the base unit's receiver 210 and the VCO 227 of the remote unit's transmitter 205 selects a second frequency at step 550. In the illustrated embodiment, step 550 is performed substantially simultaneously as step 540 is performed. That is, the VCO 282 of the base unit's receiver 210 and the VCO 227 of the remote unit's transmitter 205 selects the second frequency upon the base unit 110 transmitting signals to the remote unit 120. *See* Specification, pg. 15, lines 4 – 18.

At step 560, the base unit's receiver 210 and the remote unit's transmitter 205 are enabled by the controller 220, and the base unit's transmitter 205 and the remote unit's receiver 210 are disabled. The remote unit 120 transmits to the base unit 110 during a second time frame, at step 570, using the second frequency (tripled) that was selected in step 550. Next at step 580, it is determined whether communication between the base and remote units 110, 120 is to continue. In one embodiment, such determination could be made by the user of the remote unit 120 actuating a termination button (not shown), for example. If communication between the base and remote units 110, 120 is to terminate at step 580, the process 500 ends. However, if communication is to continue between the base and remote units 110, 120, then the process 500 reverts back to step 520, where the VCOs 227 and 282 of the base and remote unit's transmitter and receiver 205, 210, respectively select a new frequency in the second time frame. Selection of this new frequency in step 520 is then used

for transmission from the base unit 110 to the remote unit 120 in a third time frame in step 540. *See* Specification, pg. 15, lines 20 – 25 through pg. 16, lines 1 – 8.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 1-19 are unpatentable under 35 U.S.C. § 103(a) under U.S. Patent No. 5,966,665 (***Taki***) in view of U.S. Patent No. 4,654,859 (***Kung***).

2. Whether claim 20 is unpatentable under 35 U.S.C. § 103(a) under U.S. Patent No. 5,966,665 (***Taki***) in view of U.S. Patent No. 4,654,859 (***Kung***) as applied to claim 1, and further in view of U.S. Patent No. 5,590,410 (***Deutsch et al.***).

VII. ARGUMENT

The present invention is directed to providing communications between a first and a second communication unit. *See*, Specification, page 14, lines 14-20. The present invention calls for the communication units to communicate using a first frequency during a first time frame and selecting an initial frequency using a voltage controlled oscillator. *See*, Specification, page 15, lines 4-12. A second frequency may be selected by multiplying the initial frequency by a frequency multiplier during a second time frame. *See*, Specification, page 15, lines 13-23. The first and second communication units may then communicate over a second frequency over a second time frame.

The Examiner relies heavily on ***Taki*** to reject the pending claims in the instant patent application. In contrast to the various embodiments of the claimed invention, ***Taki*** is directed to communications that includes a second frequency, where the CV frequency of the base unit

receiver in the first frame (phases 51, 52 and 53). ***Taki*** is directed to a new hop phase that is entered every time the frame number frame counter 32 is reset. However, the frame of the base unit 50 and the handset unit 60 of ***Taki*** do not call for changing frequencies within a particular frame. The Examiner also relies on ***Kung*** reject the pending claims in the instant patent application. However, ***Kung*** does not make for the deficit of ***Taki***. ***Kung*** is directed to a channel hopping system that provides a VCO output that is divided (not multiplied) by factor (M) to produce an input reference frequency for a phase locked loop (see col. 3, lines 28-34; and Figure 1). ***Kung*** does not provide the selecting and initial frequency using a VCO. ***Kung*** also does not provide a second frequency by multiplying the initial frequency during a time period within the first frame. In contrast, claims of the present invention calls for calls for the communication units to communicate using a first frequency during a first time frame and selecting an initial frequency using a voltage controlled oscillator, and selecting a second frequency may multiplying the initial frequency by a frequency multiplier during a second time frame. The combination of ***Taki*** and ***Kung*** do not anticipate or make obvious all of the elements of claims of the present invention.

The specific claims of the present invention are discussed below.

A. Claims 1-19 Are Not Rendered Unpatentable under 35 U.S.C. § 103(a) by U.S. Patent No. 5,966,665 (*Taki*) in view of U.S. Patent No. 4,654,859 (*Kung*)

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Second, there must be some suggestion or motivation, either in the references

themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Third, there must be a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on appellant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991); M.P.E.P. § 2142. Moreover, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974). If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); M.P.E.P. § 2143.03.

With respect to the alleged obviousness, there must be something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561 (Fed. Cir. 1986). In fact, the absence of a suggestion to combine is dispositive in an obviousness determination. *Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573 (Fed. Cir. 1997). The mere fact that the prior art can be combined or modified does not make the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990); M.P.E.P. § 2143.01. The consistent criterion for determining obviousness is whether the prior art would have suggested to one of ordinary skill in the art that the process should be carried out and would have a reasonable likelihood of success viewed in the light of the prior art. Both the suggestion and the expectation of success must be founded in the prior art, not in the Appellant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991; *In re O'Farrell*, 853 F.2d 894 (Fed. Cir. 1988); M.P.E.P. § 2142.

Appellant respectfully asserts that the Examiner did not meet the legal standards to reject the claims of the present invention under 35 U.S.C. § 103(a) because the prior art references (***Taki*** and ***Kung***) do not teach or suggest all the claim limitations of the claims of the present invention. Additionally, the Examiner has not provided sufficient evidence or arguments that there is a suggestion that one skilled in the art would have been motivated to combine the references (***Taki*** and ***Kung***). In fact, Appellant provides arguments that ***Taki*** and ***Kung*** would not have been combined by one skilled in the art. Therefore, the Examiner did not meet the legal standards to establish a *prima facie* case for obviousness under 35 U.S.C. § 103(a) with regarding to claims 1-20 of the present invention.

Claims 1-19 stand rejected as unpatentable under 35 U.S.C. § 103(a) by U.S. Patent No. 5,966,665 (***Taki***) in view of U.S. Patent No. 4,654,859 (***Kung***). Appellant respectfully asserts that the Examiner erred in maintaining this rejection.

Group I Claims (Claims 1, 2, 5, 6, 10-11, 13-15, and 18-19) Are Not Rendered Unpatentable under 35 U.S.C. § 103(a) by *Taki* in view of *Kung*

Claim 1 of the present invention calls for a first and second communication units to communicate using a first frequency during a first time frame and selecting an initial frequency using a voltage controlled oscillator. Claim 1 also calls for a second frequency being selected by multiplying the initial frequency by a frequency multiplier during a second time frame. The first and second communication units may then communicate over a second frequency over a second time frame. These features are not disclosed, taught, or made obvious by ***Taki***, ***Kung***, nor their combination.

In the Final Office Action dated November 18, 2004, the Examiner asserted that ***Taki*** discloses a second frequency where the CV frequency of the base unit receiver in the first frame (phases 51, 52 and 53) is disclosed, thereby anticipating changing the frequency within the first time frame. Appellant respectively disagrees. The frame of the base unit 50 and the handset unit 60 disclosed in Figure 3 do not call for changing frequencies <u>within a particular frame</u>. The frame of the base unit cited by the Examiner, for example, comprises a frequency hop phase 51, a transmission phase 52, a transmission/reception switch phase 53, and a reception phase 54. In describing the various phases of the frame, ***Taki*** does not disclose changing the frequency within this particular frame, as called for by claims of the present invention. ***Taki*** discloses that the frequency may be changed at every frame, which relates to changing the frequency in the frequency hop phase 51. ***Taki*** discloses that there is only one frequency hop phase 51 per frame (see Figure 3). The frequency hop phase 51 is at the beginning of the frame. Therefore, the frequency is only changed between frames and not within a frame.

As disclosed by ***Taki***, after the frequency hop phase 51, the frequency is not changed for the remainder of the frame. The hop counter 34 is incremented once every time a new frequency hop is entered. *See* column 6, lines 27-28. However, as described in ***Taki*** and illustrated in Figure 3, there is only one frequency hop phase 51 at the beginning of the frame followed by the transmission/reception phase 53, and the reception phase 54. Upon completion of the frame, the next frequency switching is performed at the beginning of the next frame. Therefore, contrary to the Examiner's assertion, a second frequency is only chosen <u>after the completion</u> of a frame and not <u>within</u> the frame.

In contrast to ***Taki***, claims 1 and 11 of the present invention call for selecting a second radio frequency during a time period within the first time frame. Therefore, contrary to Examiner's assertion, ***Taki*** does not disclose selecting a second frequency during a particular time frame. ***Taki*** discloses that a new hop phase is entered every time the frame number frame counter 32 is reset. *See* column 6, lines 28-32. The hop number is used as an index parameter to read hop frequency data from the hop table. *See* column 6, lines 33-34. Therefore, ***Taki*** makes it abundantly clear that the changing of the frequencies occurs at the frequency hop phase based on the frequency hop counter and the hopping table, which comprises a hop frequency data array B. *See* column 6, lines 36-53. ***Taki*** does not disclose changing the frequency within the frame. The frequencies may be hopped at the beginning of each frame. Therefore, ***Taki*** does not disclose or suggest or teach all the elements of claims 1 and 11 of the present invention. Further details regarding ***Taki*** are provided below. Hence, Examiner's assertion that ***Taki's*** frequency synthesizer provides different frequencies for hopping does not apply for changing frequencies within a frame.

Furthermore, ***Kung*** does not make for the deficit of ***Taki***. As described herein, ***Taki's*** system fails to teach selecting an initial frequency by a voltage controlled oscillator (VCO) of the first and second communication units and multiplying the initial frequency by a frequency multiplier to select a second radio frequency during a time period within the first time frame as called for by the independent claims of the present invention.

The Examiner uses ***Kung*** to provide a VCO and a frequency multiplier and states in the Advisory Action that the structure of the frequency multiplier is well known to one of ordinary skill in the art. However, merely adding the disclosure of a VCO and a frequency

multiplier to ***Taki*** does not provide selecting an initial frequency using a VCO (as called for by claims 1 and 11), nor does the combination (of ***Taki*** and ***Kung***) provide selecting a second frequency by multiplying the initial frequency during a time period within the first time frame, and subsequently performing communications in a second time frame, as called for by claims 1 and 11. In other words, ***Taki*** is missing more than the elements of a VCO, frequency multiplication, or frequency synthesizer contrary to Examiner's suggestions in the Final Office Action dated November 18, 2004. Therefore, adding the disclosure of ***Kung*** would not make up for the deficits of ***Taki***.

Kung does not provide the selecting and initial frequency using a VCO. ***Kung*** also does not provide a second frequency by multiplying the initial frequency during a time period within the first frame. ***Kung*** discloses a channel hopping system that provides a VCO output that is divided (not multiplied) by factor (M) to produce an input reference frequency for a phase locked loop (see col. 3, lines 28-34, Figure 1). The mere mention of multiplying a frequency in ***Kung*** does not disclose multiplying an initial frequency to produce a second frequency during a first time frame, as called for by claims 1 and 11. Therefore, contrary to the Examiner's assertions in the Advisory Action, ***Kung*** teaches away from the multiplying of the initial frequency, as called for by claims 1 and 11. Neither ***Taki***, ***Kung***, nor their combination, disclose, teach, or make obvious selecting an initial frequency using a VCO, nor does the combination provide selecting a second frequency by multiplying the initial frequency during a time period within the first time frame, and subsequently performing communications in a second time frame, as called for by claims 1 and 11. Therefore, ***Taki***, ***Kung***, nor their combination disclose or make obvious all of the elements of claims 1 and 11 for at least the reasons cited above. Accordingly, Appellants respectfully assert that the Examiner erred in maintaining the rejection of claims 1 and 11 under 35 U.S.C. § 103(a) because the Examiner did not meet the legal standards to establish a *prima facie* case for obviousness based upon ***Taki***, ***Kung***, or their combination. Therefore, claims 1 and 11 are allowable.

Independent claims 1 and 11, are allowable for at least the reasons cited above. Additionally, dependent claims 2-10 and 12-20, which depend from independent claims 1 and 11 are also allowable for at least the reasons cited above.

The arguments provided herein apply for claims 1, 2, 5, 6, 10-11, 13-15, and 18-19 (Group I), claims 3, 4, 7 and 12 (Group II), and claims 8, 9, 16, and 17 (Group III). In light of

the arguments provided herein, the Examiner erred in rejecting claims 1-19 under 35 U.S.C. § 103(a) based upon ***Taki*** and ***Kung***.

Group II claims (Claims 3, 4, 7, and 12) Are Not Rendered Unpatentable under 35 U.S.C. § 103(a) by *Taki* in view of *Kung*

As described above, ***Taki***, ***Kung***, nor their combination, disclose or make obvious selecting an initial frequency by a voltage controlled oscillator (VCO) of the first and second communication units and multiplying the initial frequency by a frequency multiplier to select a second radio frequency during a time period within the first time frame as called for by Group II claims by virtue of their direct or indirect dependencies to claims 1 and 11. Additionally, ***Taki***, ***Kung***, nor their combination disclose or make obvious selecting a third radio frequency during the second time frame, as called for by Group II claims by virtue of their direct or indirect dependencies. Therefore, these additional features called for by Group II claims are not disclosed or made obvious by ***Taki***, ***Kung***, nor their combination.

Hence, Group II claims (claims 3, 4, 7, and 12) are not disclosed or made obvious by ***Taki***, ***Kung***, nor their combination, and therefore, are also allowable. Accordingly, Appellant respectfully asserts that the Examiner erred in maintaining the rejection of claims 3, 4, 7, and 12 under 35 U.S.C. § 103(a) because the Examiner did not meet the legal standards to establish a *prima facie* case for obviousness based upon ***Taki***, ***Kung***, or their combination. Therefore, claims 8, 9, 16, and 17 are allowable.

Group III claims (Claims 8, 9, 16, and 17) Are Not Rendered Unpatentable under 35 U.S.C. § 103(a) by *Taki* in view of *Kung*

As described above, ***Taki***, ***Kung***, nor their combination, disclose or make obvious selecting an initial frequency by a voltage controlled oscillator (VCO) of the first and second communication units and multiplying the initial frequency by a frequency multiplier to select a second radio frequency during a time period within the first time frame as called for by Group III claims by virtue of their direct or indirect dependencies to claims 1 and 11. Additionally, ***Taki***, ***Kung***, nor their combination, disclose or make obvious tripling the initial frequency by a frequency multiplier to select a second radio frequency during the first time frame or to select a third radio frequency during a second time frame, as respectively called for by claims 8 and 16 and claims 9 and 17 (Group III claims). Therefore, these additional features called for by Group III claims are not disclosed or made obvious by ***Taki***, ***Kung***, nor their combination.

Hence, Group III claims (claims 8, 9, 16, and 17) are not disclosed or made obvious by ***Taki***, ***Kung***, nor their combination, and therefore, are also allowable. Accordingly, Appellant respectfully asserts that the Examiner erred in maintaining the rejection of claims 8, 9, 16, and 17 under 35 U.S.C. § 103(a) because the Examiner did not meet the legal standards to establish a *prima facie* case for obviousness based upon ***Taki***, ***Kung***, or their combination. Therefore, claims 8, 9, 16, and 17 are allowable.

Group IV Claim (Claim 20) Is Not Rendered Unpatentable under 35 U.S.C. § 103(a) by *Taki* in view of *Kung* as applied to claim 1, and further in view of U.S. Patent No. 5,590,410 (*Deutsch*)

Appellant respectfully asserts that the Examiner did not meet the legal standards to reject claim 20 of the present invention under 35 U.S.C. § 103(a) because the prior art references (***Taki***, ***Kung***, and ***Deutsch***) do not teach or suggest all the claim limitations of the claims of the present invention. Additionally, the Examiner has not provided sufficient evidence or arguments that there is a suggestion that one skilled in the art would have been motivated to combine the references (***Taki***, ***Kung***, and ***Deutsch***). In fact, Appellant provides arguments that ***Taki***, ***Kung***, and ***Deutsch*** would not have been combined by one skilled in the art. Therefore, the Examiner did not meet the legal standards to establish a *prima facie* case for obviousness under 35 U.S.C. § 103(a) with regarding to claim 20 of the present invention.

Claim 20 stands rejected as unpatentable under 35 U.S.C. § 103(a) by U.S. Patent No. 5,966,665 (***Taki***) in view of U.S. Patent No. 4,654,859 (***Kung***), as applied to claim 1, and further in view of U.S. Patent No. 5,590,410 (***Deutsch***). Appellant respectfully asserts that the Examiner erred in maintaining this rejection.

Contrary to the Examiner's previous assertions, Appellant respectfully submits that claim 20, which either directly or indirectly depends from independent claim 11 of the present invention, is not disclosed or made obvious by ***Taki***, ***Deutsch***, nor their combination. As described above, ***Taki*** does not disclose selecting a second frequency by multiplying the initial frequency during a time period within the first time frame, and subsequently performing communications in a second time frame, as called for by claim 11. Additionally, as described above, ***Kung*** does not provide these elements in claim 11 (and therefore, in claim 20 due to its dependency to claim 11) that are not provided by ***Taki***. Adding the disclosure of ***Deutsch***, which the Examiner cites for providing an external telephone circuit as the PSTN, does not

make up for this deficit. In other words, even adding the disclosures of ***Kung*** and ***Deutsch*** to ***Taki*** would still not provide all of the elements of claim 20.

Appellant respectfully asserts that the Examiner erred in maintaining this rejection, and for at least the reasons cited above, claim 20 is allowable. Accordingly, Appellant respectfully asserts that the Examiner erred in maintaining the rejection of 20 under 35 U.S.C. § 103(a) because the Examiner did not meet the legal standards to establish a *prima facie* case for obviousness based upon ***Taki***, ***Kung***, ***Deutsch,*** or their combination. Therefore, claim 20 is also allowable.

CONCLUSION

In view of the foregoing, it is respectfully submitted that the Examiner erred in not allowing all claims (claims 1-20) pending in the present application over the prior art of record. The undersigned attorney may be contacted at (713) 934-4069 with respect to any questions, comments, or suggestions relating to this appeal.

Respectfully submitted,

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CLAIMS APPENDIX

1. (Previously presented) A method for transmitting communication between first and second communication units over a plurality of radio frequencies, the method comprising:

setting the first and second communication units to respectively transmit and receive communication over a first radio frequency during a first time frame;

selecting an initial frequency by a voltage controlled oscillator of the first and second communication units and multiplying the initial frequency by a frequency multiplier to select a second radio frequency during a time period within the first time frame; and

setting the first and second communication units to respectively receive and transmit communication over the second radio frequency during a second time frame.

2. (Original) The method of claim 1, wherein selecting a second radio frequency, further comprises:

selecting a second radio frequency by the first and second communication units during the first time frame.

3. (Original) The method of claim 1, further comprising:

selecting a third radio frequency during the second time frame; and

setting the first and second communication units to respectively transmit and receive communication over the third radio frequency during a third time frame.

4. (Original) The method of claim 3, wherein selecting a third radio frequency, further comprises:

selecting a third radio frequency by the first and second communication units during the second time frame.

5. (Original) The method of claim 1, wherein setting the first and second communication units to respectively transmit and receive communication over a first radio frequency during a first time frame, further comprises:

setting a transmitter of the first communication unit and a receiver of the second communication unit over a first frequency to respectively transmit and receive communication between the first and second communication units during a first time frame.

6. (Original) The method of claim 1, wherein setting the first and second communication units to respectively receive and transmit communication over the second radio frequency during a second time frame, further comprises:

setting a receiver of the first communication unit and a transmitter of the second communication unit over the second radio frequency to respectively receive and transmit communication between the first and second communication units during a second time frame.

7. (Original) The method of claim 3, wherein setting the first and second communication units to respectively transmit and receive communication over the third radio frequency during a third time frame, further comprises:

setting a transmitter of the first communication unit and a receiver of the second communication unit over the third radio frequency to respectively transmit and receive communication between the first and second communication units during a third time frame.

8. (Original) The method of claim 1, wherein selecting a second radio frequency during the first time frame, further comprises:

selecting an initial frequency by a voltage controlled oscillator of the first and second communication units and tripling the initial frequency by a frequency multiplier to select a second radio frequency during the first time frame.

9. (Original) The method of claim 3, wherein selecting a third radio frequency during the second time frame, further comprises:

selecting an initial frequency by a voltage controlled oscillator of the first and second communication units and tripling the initial frequency by a frequency multiplier to select a third radio frequency during the second time frame.

10. (Original) The method of claim 1, wherein the first communication unit is a base unit and the second communication unit is a remote unit of a cordless telephone system.

11. (Previously presented) An apparatus, comprising:

a first and second communication unit for communication therebetween over a plurality of radio frequencies, the first and second communication units each including:

a controller adapted to set the first and second communication units to respectively transmit and receive communication over a first radio frequency during a first time frame, select an initial frequency by a voltage controlled oscillator of the first and second communication units and multiplying the initial frequency by a frequency multiplier to select a second radio frequency during a time period within the first time frame, and set the first and second communication units to respectively receive and transmit communication over the second radio frequency during a second time frame.

12. (Original) The apparatus of claim 11, wherein the controller is further adapted to select a third radio frequency during the second time frame, and set the first and second communication units to respectively transmit and receive communication over the third radio frequency during a third time frame.

13. (Original) The apparatus of claim 11, wherein said first and second communication units further comprise:

a transmitter; and

a receiver; and

wherein the controller is further adapted to set the transmitter of the first communication unit and the receiver of the second communication unit over a first frequency to respectively transmit and receive communication between the first and second communication units during the first time frame.

14. (Original) The apparatus of claim 13, wherein the controller is further adapted to set the receiver of the first communication unit and a transmitter of the second communication unit over the second radio frequency to respectively receive and transmit communication between the first and second communication units during the second time frame.

15. (Original) The apparatus of claim 12, wherein said first and second communication units further comprise:

a transmitter; and

a receiver; and

wherein the controller is further adapted to set the transmitter of the first communication unit and the receiver of the second communication unit over the third radio frequency to respectively transmit and receive communication between the first and second communication units during the third time frame.

16. (Original) The apparatus of claim 13, wherein the transmitter and receiver of the first and second communication units each include:

a voltage controller oscillator controlled by a phase-locked loop; and

a frequency multiplier; and

wherein the voltage controlled oscillator is adapted to select an initial frequency and the frequency multiplier is adapted to triple the initial frequency to select the second radio frequency during the first time frame.

17. (Original) The apparatus of claim 15, wherein the transmitter and receiver of the first and second communication units each include:

a voltage controller oscillator controlled by a phase-locked loop; and

a frequency multiplier; and

wherein the voltage controlled oscillator is adapted to select an initial frequency and the frequency multiplier is adapted to triple the initial frequency to select the second radio frequency during the third time frame.

18. (Original) The apparatus of claim 11, wherein the apparatus is a cordless telephone system.

19. (Original) The apparatus of claim 11, wherein the first communication unit is a base unit and the second communication unit is a remote unit of a digital cordless telephone system.

20. (Original) The apparatus of claim 19, wherein the base unit is coupled to the public switched telephone network (PSTN).